Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Review of the Spectrum Sharing Plan Among	)	IB Docket No. 02-364
Non-Geostationary Satellite Orbit Mobile	)	
Satellite Service Systems in the 1.6/2.4 GHz Bands	)	

COMMENTS OF THE LICENSE-EXEMPT ALLIANCE

The License-Exempt Alliance ("LEA") hereby submits its initial comments in response to the Commission's *Notice of Proposed Rulemaking* ("*NPRM*") in the above-referenced proceeding ("*NPRM*").[1]

In the recently completed predecessor to this proceeding, IB Docket No. 01-185, the Commission established a regulatory framework under which Mobile Satellite Service ("MSS") providers are permitted to provide an Ancillary Terrestrial Component ("ATC") in, *inter alia*, the MSS "Big LEO" downlink band at 2483.5-2500 MHz.[2] Now, in the *NPRM*, the Commission seeks comment on whether the sole MSS occupant of the 2483.5-2500 MHz band, Globalstar, is actually using the entire band and, if not, whether the Commission should reclaim any spectrum Globalstar is not using and reallocate it for, *inter alia*, license-exempt services.[3] In particular, the Commission

[1] *See Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands*, IB Docket No. 02-364, FCC 03-15, at ¶¶ 265-273 (rel. Feb. 10, 2003). The LEA is a nationwide coalition of wireless Internet service providers ("WISPs") and equipment vendors who provide or support the provision of broadband service via license-exempt spectrum in the 902-928 MHz, 2.4 GHz and 5 GHz bands. It has been and continues to be the primary advocate for "last mile" license-exempt broadband providers in a variety of Commission proceedings that directly affect the allocation and use of license-exempt spectrum.

[2] *See Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands*, IB Docket No. 01-185, FCC 03-15 (rel. Feb. 10, 2003).

[3] *See NPRM* at ¶¶ 269-272.

suggests that it may reallocate the 2483.5-2492.5 MHz and 2498-2500 MHz bands for license-exempt use.[4] For the reasons set forth below, the LEA fully supports this proposal.

As an initial matter, it is now clear that license-exempt services are entitled to consideration where spectrum allocation is concerned, notwithstanding their secondary status for purposes of interference protection. The Commission reaffirmed as much just weeks ago in its decision to award the terrestrial amateur radio service primary status in the 2400-2402 MHz band:

> Although [the American Radio Relay League] is correct that unlicensed users do not have protection rights vis-à-vis licensed users in a band, it is incorrect when it asserts that we need not consider unlicensed use of this band when deciding whether to modify the allocation. The issue here . . . is whether different uses are compatible and promote efficient use of spectrum. *This analysis requires that we consider both licensed and unlicensed use*.[5]

Likewise, it is equally clear that license-exempt services are the most significant success story in the telecommunications industry of late, and that allocation of additional spectrum for those services would serve the public interest. Indeed, the Commission's Spectrum Policy Task Force ("SPTF") concluded that "[t]he currently available spectrum for unlicensed operations has spawned a significant market for unlicensed devices and, as a result, the Commission should consider designating additional bands for unlicensed use to better optimize spectrum access."[6] More recently, the Commission highlighted some statistics that support the SPTF's recommendation:

> [M]arket projections indicate that unlicensed wireless network products grew rapidly over the past two years and that future sales volumes are predicted to increase even more dramatically when market conditions improve. For example, the Synergy Research Group reported that the Wireless LAN market posted its eighth consecutive quarter of double-digit growth and has grown at a rate of more

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[4] *Id.* at ¶ 272.

[5] *Amendment of Parts 2 and 97 of the Commission's Rules to Create a Low Frequency Allocation for the Amateur Radio Service*, ET Docket No. 02-98, at ¶ 45 (rel. May 14, 2003) (emphasis added).

[6] Report of The Federal Communications Commission's Spectrum Policy Task Force, ET Docket No. 02-135, at 54 (November 2002).

> than 150 percent since 2000. Further, the revenue from W-LAN shipments is projected to rise to $2.8 billion in 2003 and will continue to grow for the foreseeable future. Although estimates vary, the consensus seems to be that worldwide W-LAN sales, including Wi-Fi equipment, ranged between $1.7 and $2.0 billion in 2002. The Wireless LAN Association foresees W-LAN equipment sales reaching $5.2 billion by 2005.[7]

Perhaps more important, however, is the fact that license-exempt spectrum is fast becoming an essential tool for "last mile" broadband deployment, particularly in rural and other underserved areas that cannot or will not be served by incumbent wireline technologies.[8] Here the distinction between "hotspots" and last mile broadband deployments is critical. Unlike hotspots, whose value normally is recognized exclusively by the operator, user and/or retail storefront provider, last mile broadband has a value chain that includes the operator and the total community of homes, businesses, schools, hospitals, municipalities and other entities within the wireless footprint. Logically, then, the delivery of last mile broadband service to rural and other underserved areas remains among the Commission's highest priorities:

> There continues to be a significant disparity in access to advanced services between those living in rural population centers and those living in sparsely-populated outlying areas. As a result, we believe that it is important to closely monitor the availability of advanced services for rural Americans, especially those

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[7] *Revision of Parts 2 and 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, ET Docket No. 03-122, at ¶ 11 (rel. June 4, 2003).

[8] *See, e.g., Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 – Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services (Seventh Report)*, 17 FCC Rcd 12985, 13074 (2002) ("Several smaller fixed wireless carriers, including hundreds of operators using unlicensed spectrum, continue to provide high-speed Internet access service, generally in less densely populated markets across the country . . . . In fact, at least one industry analyst claims that, while fixed wireless has the potential to compete with DSL and cable modem service, the technology is best-suited for rural and underserved markets where these services may not be available.") (footnotes omitted); Lindstrom, "Driving Profits – Without a License," *Broadband Wireless Online* (October 2001) (quoting officer of license-exempt equipment vendor WaveRider Communications, Inc.: "Our typical customers go after and serve second, third and fourth-tier markets with less than 100,000 people in them. These are the markets that the ILECs and cable companies overlook.").

living outside of the rural population centers, in order to ensure that they receive timely access to advanced services.[9]

All available evidence confirms that operators are aggressively deploying license-exempt spectrum to solve this problem. According to a recent Cahners In-Stat report, approximately 1,500-1,800 wireless Internet service providers ("WISPs") already are providing license-exempt broadband service to approximately 600,000 subscribers in the U.S., with subscribership expected to double by the end of 2003 and reach nearly 2,000,000 by the end of 2004.[10] Many of these WISPs were created precisely because incumbents wired providers were offering little or no broadband service to their communities. To cite just a few examples:

- ***AMA Tech Tel*** (www.amatechtel.com) provides a variety of license-exempt broadband services with a wireless footprint covering over 20,000 square miles in and around Amarillo, Texas.[11] The company currently has over 4,000 wireless broadband subscribers and anticipates adding 8,000 more within the next 12-18 months.[12] Just days ago the company announced that it has entered into a groundbreaking partnership with Texas Tech University to build and maintain a wireless broadband telecommunications backbone stretching from Amarillo to Hobbs, New Mexico. The backbone will provide access to high-speed telecommunications to the rural communities along its route. Principally, the backbone will be a wide-area network for delivery of content to be used in small business development, work force training and other adult and K-12 educational programs.[13]

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[9] *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996 (Third Report)*, 17 FCC Rcd 2844, 2888 (2002).

[10] *See* http://www.wcai.com/pdf/2003/p_instatmdrJan22.pdf; "The License-Exempt Wireless Broadband Market," Alvarion, Inc., at 8 (April 2003) ("Alvarion Report"), submitted as an attachment to *Ex Parte* Letter of License-Exempt Alliance, RM-10371 (filed April 30, 2003) ("LEA Letter").

[11] *See Ex Parte* Presentation of AMA Tech Tel, RM-10371, at 4 (April 2003) ("AMA Tech Tel Report"), submitted as an attachment to the LEA Letter.

[12] *See* Alvarion Report at 9; AMA Tech Tel Report at 4.

[13] *See* "Texas Tech University Signs Agreement to Build Network to Improve Internet Access to Rural Areas," Joint Press Release of Texas Tech University and AMA Tech Tel (July 2, 2003), available at http://www.wcai.com/press_mem2001.htm.

- ***Prairie iNet*** (www.prairieinet.net) currently provides license-exempt broadband service in the 2.4 GHz and 5.8 GHz bands to approximately 4,500 subscribers, encompassing a total of 127 communities in Iowa, Illinois and Montana. In addition to residential and business customers, the company provides service to schools, medical clinics and municipal governments. The company estimates that it is the sole provider of broadband service in approximately half of its markets. [14]

- ***Suburban Broadband LLC*** recently announced that it has entered into an agreement with ***Waverider Communications, Inc.*** (www.waverider.com) to bring broadband service to 14 counties along the Front Range of Colorado, representing more than 80% of the state's population. WaveRider's Last Mile Solution wireless systems have been deployed by service providers in 43 states, making license-exempt broadband service available to potentially hundreds of thousands of subscribers across the country.[15]

- ***NextWeb*** (www.nextweb.net) has joined forces with SkyPipeline and SkyRiver Communications to create the SkyWeb Alliance, a unified fixed wireless carrier that will serve more than 150 cities in a 5,600 square mile area in California, potentially serving half of the business establishments in the State with broadband wireless connectivity. SkyWeb's coverage area stretches from the San Francisco and Silicon Valley areas to Southern California, including the greater Los Angeles, Orange County and San Diego regions. In the future, the SkyWeb network could be used to serve many of the 4.5 million residential households that are within the SkyWeb coverage area.[16]

- ***Wheatland Electric*** (www.wbsnet.org) is a local cooperative electric utility provider to 40,000 businesses, schools and residences in an eleven-county rural area of western Kansas. Though relatively new, its Wheatland Broadband subsidiary now has approximately 1,100 buildings online in only the first initial phases of deployment. Wheatland's wireless system is capable of serving customers as far as 18 miles from a base station.[17]

- ***Allconet*** (http://prime.allconet.org/allconet2/) operates in Allegany County, Maryland, in the foothills of the Appalachian Mountains. Allconet is among the most

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[14] *See* http://www.wcai.com/interview.htm.

[15] *See also* Barthold, "Wireless Internet Opens Communications in Small Iowa Communities," *TelephonyOnline.Com* (Sept. 4, 2002) (discussing Airolink's launch of license-exempt broadband service in rural Iowa communities).

[16] *See* "California's Leading Wireless ISPs Join Forces to Create SkyWeb Alliance for Broadband Internet Services," available at http://www.skyweballiance.com/pressrelease.html.

[17] *See* Alvarion Report at 10.

sophisticated municipally owned license exempt wireless broadband systems in the United States, connecting every government and other public entity in the area (over 90 buildings in total, including every school, library, municipal office, police station house, etc.). It is anticipated that this year the system will expand to provide broadband access to approximately 85% of the residents, 95% of the businesses and 100% of the government and industrial parks in the County.

- ***Midwest Wireless***, a mobile wireless service provider with over 250,000 customers, has deployed Alvarion equipment to deliver license-exempt broadband service to communities encompassing 3,500 square miles in rural Minnesota. The company has already rolled out the service in 30 communities, many of which have little or no other broadband service.[18]

- ***Northwest Communications***, a local exchange carrier serving in northwest Iowa, offers license-exempt broadband service in all of the license-exempt bands to residential and business subscribers in 22 rural communities from about 30 tower sites. In its original incarnation as a wired telephone company, the company's service area encompassed 23 square miles around Havelock, IA. By virtue of its wireless service, the company now operates across thousands of square miles in some 60 communities.[19]

- The city of ***Ellasville, Georgia*** offers license-exempt broadband service in the 902-928 MHz band via WaveRider equipment. Presently, the city's system uses three transmitting antennas mounted on the city's main water tank, and permits access at speeds exceeding 300 Kbps at a distance of over two miles.[20] Also, WaveRider equipment is being used to build a high-speed wireless network in Fort Valley, Georgia through a project called ***GeorgiaSpeed.Net.*** The project arose from a multi-year contract between the Fort Valley Utility Commission and Tri-State Broadband Inc. to install a hybrid fiber-wireless broadband network. The network will bring symmetrical Internet access speeds of up to 1.5 Mbps to Fort Valley and Peach County area businesses and residents.[21]

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[18] *See* press releases at http://www.alvarion.com/RunTime/CorpInf_30130.asp?fuf=270&type=item and http://www.midwestwireless.com/mwc_about/mwc_asbout_press.asp?NewsDetailId=88.

[19] *See* Blackwell, "Northwest Communications, Growing Against the Grain," available at http://isp-planet.com/fixed_wireless/business/2002/northwest_comm.html (Aug. 27, 2002).

[20] *See* Mackie, "City in Southwestern Georgia Deploys WaveRider's System," *Broadband Wireless Online* (July 3, 2002); Blackwell, "Small Cities Serve Their Own," www.isp-planet.com (June 25, 2002).

[21] *See* http://isp-planet.com/fixed_wireless/wi-fi_briefs/2002/021107.html.

- ***Office Equipment of Odessa, WA*** has been providing license-exempt broadband service to rural communities in the Pacific Northwest since 1997. Its network presently covers 2,100 square miles in and around Odessa – nearly every community served by the company has a population of fewer than 1,000 people. Among other things, the company donates its service to local law enforcement in Odessa – as a result, police cars in the community have up to T1 speed VPN access directly into law enforcement computer networks. This is believed to be the first project of its type in the State of Washington.[22]

- ***Joink, Inc.*** (www.joink.com) provides broadband service in the 902-928 MHz band to rural communities in western Indiana and eastern Illinois. The company has already launched the service in eight communities, with plans to add 30 more throughout its region. Joink delivers its service through a network of Authorized Dealers, who provide customers with a local storefront through which they may obtain and pay for service. In addition, Joink has a Broadband Community Alliance program that permits a community leader to bring Joink's service to a small or underserved area.[23]

- ***REA-ALP*** is a utility cooperative in Alexandria, Minnesota serving approximately 7,000 customers. Using equipment supplied by Alvarion and WaveRider, it provides license-exempt broadband service via the 2.4 GHz and 902-928 MHz bands, competing with eight ISPs plus local cable modem and DSL service. REA-ALP is able to provide reliable non-line of sight service at distances up to 1.5 miles, and reliable line of sight service at distances up to 4.7 miles.[24]

Furthermore, recent developments in the standards-setting process will only accelerate last mile broadband deployments over license-exempt spectrum. By now the Commission is aware of the recently-adopted IEEE 802.16a standard, which will support delivery of outdoor broadband service over license-exempt spectrum at distances up to 30 miles, with a typical cell radius of 4-6 miles.[25] As recently noted by Intel, "[w]ith shared data rates up to 75 Mbps, a single 'sector' of an

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[22] *See* http://www.wcai.com/interview.htm.

[23] *See* http://www.waverider.com/en/news/releases/release.cfm?id=113.

[24] *See* Sanders, "Hybridized 900 MHz NLOS Systems," *Broadband Wireless Business*, at 20 (July/August 2002).

[25] *See* IEEE 802.16 and WiMAX – Broadband Access for Everyone," Intel Corporation White Paper, at 3 (2003). Wooley, "Wider-Fi," *Forbes* (Apr. 14, 2003) (available at www.forbes.com) (802.16a "extends

802.16(a) base station – where sector is defined as a single transmit/receive radio pair at the base station – provides sufficient bandwidth to simultaneously support more than 60 businesses with T1 connectivity, using 20 MHz of channel bandwidth."[26] According to one analyst, "under the current conditions, 802.16a could emulate 802.11's rise several years from now," potentially reaching $1 billion in sales by 2008.[27]

From a consumer perspective, then, there is more than ample justification for the Commission to support license-exempt wireless broadband deployment via an allocation of additional license-exempt spectrum in the 2483.5-2492.5 MHz and 2498-2500 MHz bands. Concurrently, such an allocation would advance the overriding policy objectives endorsed by the SPTF. *First*, the allocation would at least to some extent achieve the SPTF's objective of finding more spectrum for license-exempt services, without implicating the complex legal and technical issues associated with "underlaying" license-exempt services in licensed spectrum. *Second*, since the 2400-2483.5 MHz band is already allocated for license-exempt services, and since the MDS/ITFS spectrum at 2500-2690 MHz is being utilized for wireless broadband service as well, allocation of the 2483.5-2492.5 and 2490-2500 MHz bands would promote the SPTF's "good neighbor" policy, under which adjacent spectrum should be allocated to technically compatible

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the wireless range of Wi-Fi from roughly 300 feet to several miles and lets signals bounce around obstacles and penetrate walls; it also fixes security flaws and adds high-quality phone calls").

[26] Intel White Paper at 3..

[27] *See* http://www.visantstrategies.com/pr80216.htm

services in a manner which minimizes interference and eliminates the need for excessive technical and regulatory constraints.[28]

Third, the proposed allocation would alleviate frequency congestion and promote spectral efficiency. As noted in the comments filed in this proceeding by the IEEE Local and Metropolitan Area Networks Standards Committee ("IEEE 802"), extending the 2400-2483.5 MHz license-exempt band to 2492.5 MHz would permit operation of four simultaneous channels in one physical location.[29] Operation with four single-duplex channels, which could be combined into two full-duplex channels, reduces the cost of delivering high amounts of bandwidth on a point-to-point basis. In turn, as the economics of high bandwidth point-to-point operations improve, there is less need for operators to deliver service via less spectrally efficient omnidirectional facilities. In addition, since manufacturers already make radios that go above 2483.5 MHz to accommodate the overseas market, extension of the 2400-2483.5 MHz license-exempt band to 2492.5 MHz would permit greater economies of scale in the manufacture and distribution of equipment for license-exempt services.

Finally, the proposed allocation is the shortest path to accelerated facilities-based broadband deployment in the 2483.5-2492.5 and 2498-2500 MHz bands, particularly in rural and other underserved areas. Most obviously, license-exempt wireless service is far cheaper and faster to deploy in rural and other underserved areas than wired technologies – indeed, as discussed above, many rural WISPs were created precisely because their communities have little or no wired broadband service whatsoever. Second, license-exempt wireless technology is readily scalable, and thus is capable of addressing changes in consumer demand for bandwidth very quickly. Also, many license-exempt wireless broadband systems are deploying non-line of sight, "plug and play" CPE

[28] *See* Federal Communications Commission Spectrum Policy Task Force, Report of the Interference Protection Working Group, at 20 (Nov. 15, 2002).

[29] *See* Comments of IEEE 802, IB Docket No. 02-364, at 3 (filed July 11, 2003).

that eliminates "truck rolls" and thus substantially lowers installation costs. The net result is that license-exempt providers are capable of reaching profitability in a shorter period of time, which in turn will drive even more widespread deployment of license-exempt broadband service throughout the country.[30]

In sum, the proposed allocation presents the Commission with an excellent opportunity to enhance the value of license-exempt broadband service without imposing any cognizable harm whatsoever on MSS or other licensed services. We urge the Commission to make the proposed allocation as promptly as possible, so that an even greater number of consumers may receive the benefits of license-exempt broadband service in the near term.

Respectfully submitted,

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[30] *See, e.g.,* Lindstrom, n. 8 *supra* (quoting representative of license-exempt vendor Navini: "We offer 50% lower cost of ownership than DSL and cable modems and we are 70% cheaper than other fixed wireless solutions.").